Economics of Crime
Corruption

1 Corruption

Serious problem in developing and transition countries. Taking bribes, diversion of public resources.

Modeling-wise, can be thought of as a collusion between two agents (public official and a citizen/firm seeking some favor from the government - award of government contract, issuance of a permit etc) against the principal (mainly general public).

1.1 Micro studies on the extent of corruption

Micro studies on corruption - two broad approaches to detecting and measuring:

Audit studies

The researcher has access to a result of some official audit or conducts the audit himself. Requires some anti-corruption attitude in the country's public sector. Usually gives easy-to-believe findings on the magnitude of corruption, in dollar amounts (or at least a lower bound on these).
Drawback: access to data, expensive, corruption may be systematically under-detected in the data; may not give behavioral responses.

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"Data pattern" studies

The researcher uses generally available data on some economic outcomes (prices in procurement contracts, test scores, sports results) that are potentially affected by corruption. Tries to detect the magnitude of corruption by searching for unusual patterns in the data; needs to make some assumption on how the outcomes would differ when they are a result of honest versus corrupt behavior. The data used is generally available and cheap; the data is true in the sense that it captures actual behavior; but we do not get a real "proof" of corrupt behavior, findings hinge on assumptions.

It is pointless to use official data on corruption as measured by actual convictions by police.

As people make choices, they leave all kinds of official, available data behind (test scores, sports scores, prices, contracts, receipts). When they behave corruptly, they leave different data than if they behave honestly. Distribution of scores in corrupt games is different from the distribution in honest games. Prices in corrupt procurement are different than in honest procurement. Ex-post increases in prices are more common in corrupt procurements. It's a challenge for economists to detect all this.

1.1.1 Svensson and Reinikka (2004): Corruption in a school support program in Uganda

Uganda spends 20 percent of its public expenditure on education. One such spending program was a capitation grant, an amount per student set at the central level, that was sent to primary school and should be used to cover their non-wage expenditures. The local district offices were the distribution channel from the central government to the school. They measure the fraction of funds disbursed by the central government that actually reaches the schools.

Official government accounts are not that useful. They conduct a survey of 250 primary school, asking how much money they received in the capitation grant. Then match with the central and district governments' records on amounts sent from the center and receipts by local government offices. Nothing stolen at the central level. Data from years 1991 to 1995.

Share of funds actually receive by schools: average 13 percent; median 0; 73% of schools received less than 5%; only 10% of schools received more than 50% of intended funds. Indicative evidence that the funds are captured by local government officials and politicians and used to finance running of political parties. Schools in richer, more educated areas received more => the subsidy *as implemented* through the corrupt scheme was regressive.

As this evidence became known, the central government started publishing accounts of the monthly transfers of capitation grants to districts in newspapers. Follow-up paper: this made a large improvement; in 2001, schools received 80% of entitlements. More knowledge about

the program caused this improvement. Svensson and Reinekka administered a survey of school principals about their knowledge of the capitation grant program. The schools closer to the nearest newspaper outlet knew more. Using distance as an instrument, they find that school with more knowledge experienced a larger reduction in the share of funds captured by corruption.

Lesson: **giving citizens access to public information and organizing voice is a potentially effective way of curbing corruption.**

1.1.2 Ferraz (2005): Local corruption in Brazil and re-election incentives

President Lula won the election partly on an anti-corruption crusade. In April 2003, the central government started an audit program of municipalities, which receive large transfers from the central government (15% of central government revenue). Each month, there is a lottery which determines which of the municipalities (those with less than 450,000 inhabitants) will be audited by the General Accounting Office. 10 to 15 auditors are then sent to the city, check all the documents, invoices, procurement bids and contracts etc during one week, and publish a report which is posted on the Internet. Audits done on the use of federal funds in 2001-2003.

Good things about this:

1. Presumably a serious audit.
2. Random selection of cities - no bias of auditors going to places where they have a prior hints that they may find something.
3. Audits done on transactions that occurred before the audit program started.

Ferraz reads all the reports, which list and briefly describe each "irregularity", and in most cases provide the money amount involved. Classifies irregularities into illegal procurement practices, diversion of funds, over-invoicing, and some other that are quite likely to be due to poor administration rather than outright corruption (unfinished and unpaid projects, failure to spend allocated budget).

Findings (Tables 1-3):

1. Illegal procurement practice found in 54% of cities
2. Diversion of funds in 48%
3. Over-invoicing in 6%
4. Overall, some corrupt irregularity in 73% of places.

5. Conditional on having a corrupt irregularity, there were 2.4 irregularities found in a city on average => sounds too good to be true, appears like these audits have found a small share of total corruption.

6. Amount of resources diverted: 9.1 % of amount audited (so that is not small, though much smaller than Uganda, but on the other hand Brazil is more developed). Most is in health and education - decentralized in the 1980's yet little accountability.

Ferraz uses this data to study whether political accountability can curb corruption. In Brazil, mayors can serve at most two election terms, so the mayors in the last term have less to lose by being found corrupt since they are not going to be re-elected anyway. (There may be some discipline imposed by the political party). Does not have the ideal experiment (cities with and without term limits), rather has all cities with term limits but has mayors in their first and second term.

Basic regressions (Table 5 and 6): Regresses a measure of corruption on the second-term dummy, mayor and city characteristics, state dummies etc. Second-term mayors capture 3.4-4 percent more funds and have about 0.5 more irregularities.

What affects corruption? The effect of the second term is reduced by the presence of additional checks on mayor's misuse of power: the presence of a judge in the city and the number of radio stations. So in places with a judge, the first and second term mayors are more similar. The absence of the judge reduces corruption in the first term, though; the cost of committing corruption in the second term is lower, therefore there is a stronger incentive to get re-elected and therefore to do less corruption in the first term. Increased political competition increases the gap between the first and second term mayors - if the likelihood of getting re-elected is very high anyway, the incentive to curb corruption in the first term in order to get re-elected is weak.

1.1.3 Jacob and Levitt (2005): Teacher cheating

A "data pattern" study. They develop statistical techniques to detect the amount of cheating done by teachers in Chicago public schools on standardized tests. Idea: **search for suspicious patterns of answers and unusual fluctuations in test scores.**

Dataset: administrative record of question-by-question answers to the Iowa Test of Basic Skills, taken by pupils in grades 3 through 8 in all Chicago public schools during 1993-2000. Have ID for classroom, student, school, school characteristics (not teacher ID). At the end, about 20,000 students in each grade each year (These tests did not matter much in the past but started to matter as the government was using the test scores to punish or reward schools and teachers. Cheating: changing students' answers, telling students correct answers, obtaining questions in advance and then teaching the answers.

Identification strategy:

- Teacher cheating is likely to lead to unexpected improvements in test scores in a particular class one year, followed by no improvement or decline in the following year.
- Unsophisticated cheating may leave unusual patterns of answers on an exam: identical block of answers in a class, or a student doing poorly on simple questions suddenly answers correctly difficult (more points) questions.

Measures of cheating:

1. Fluctuation: cheating => unusual increase in test score, followed by a small gain or decline next year (unless the teacher continues to cheat at the same level next year). An unusual increase in test score may also be due to better teaching, but this should leave some permanent effect, therefore the test score should rise by sth close to 1 (minus some regression to the mean). Specific measure:

$$SCORE_{cbt} = (rank\_gain_{cbt})^2 - (1 - rank\_gain_{cbt+1})^2$$

   $rank\_gain_{cbt}$ is the percentile rank of the gain in test score for class c subject b in year t. Classes that have a high gain this year and small gain next year will have high value of $SCORE$.

2. Unlikely blocks of identical answers on particular questions. They predict (multinomial probit) the likelihood that a given student gives an answer of A, B, etc. on each question, using that student's past and future test scores and characteristics. Find block of identical answers to each string of questions, assign the likelihood that this block of answers occurs, and search for the most unlikely blocks of identical answers. E.g., in a good classroom, there is a block of identical and correct answers to some easy questions - but that is a likely block. In a "bad" classroom, a block of 15 correct answers to two hard questions is unlikely to have arisen by chance. Specific measure: the likelihood of the least likely block of answers in that classroom-test.

Some unlikely fluctuations and patterns could have arisen by chance - we would like to have a counter factual of what the distribution of fluctuations and patterns would be without cheating. Their identification strategy hinges on three key assumptions: (1) cheating increases the likelihood a class will have both large test score fluctuations and suspicious answer strings, (2) if cheating classrooms had not cheated, their distribution of test score fluctuations and answer strings patterns would be identical to non-cheating classrooms, and (3) in non-cheating classrooms, the correlation between test score fluctuations and suspicious answers is constant throughout the distribution.

Depending on how strict they set the cut-off, they find that about 1.5 percent of classrooms cheat on each test and 4-5 percent cheat on at least one of the four tests.

Robustness checks:

- Are these patterns an outcome of randomness, but not cheating? All identification relies on patterns within classroom. So they randomly re-assign students to "artificial" classrooms, and then look for cheating patterns, and find none.
- Cheating is correlated within classroom over time, and across sections of the test (math vs reading)
- They inserted systematic cheating into the data, and used this algorithm to detect it, and missed a lot of cheating (when the teacher changed 6 questions for half of the class, they found it in 60% of the cases).
- With cooperation with CPS, they retested classes where the results indicated cheating and classes where there were no indications of cheating, under controlled conditions that prevented cheating. The suspected classes showed a sharp decline in the test scores, while the unsuspected classes showed no change.

1.2 Culture and corruption

Two determinants of corrupt behavior (or in general, any misuse of public office):

- Enforcement - not just criminal punishment, but also the possibility the official is fired, etc.
- Culture - the values and integrity of the official himself, social norms that (informally) condemn dishonest behavior.

Question: **How does culture affect corruption?**

Difficulties:

- Measuring culture - typically the prevailing outcome in a given country, ethnic or religious group (e.g.: culture of having many children - the actual number of children per family; the culture of corruption - prevelance of corruption measured by an index).
- Countries with weak anti-corruption culture also have weak enforcement, very hard to disentangle.
- General strategy: need to have different cultures placed in a single economic environment.

1.2.1 Fisman and Miguel 2007: Parking Tickets of UN diplomats in New York City

UN headquarters in NYC - presence of a large number of diplomats from almost all countries. Diplomatic immunity - diplomats cannot be prosecuted or sued in the U.S. If their car is ticketed, none can sue them for non-payment of the ticket = effectively no enforcement, for all practical purposes, the diplomats simply don't pay (8% of tickets are actually paid). Between Nov 1997 and 2002, diplomats accumulated over 150,000 unpaid parking tickets, outstanding fines of more than $18 million. Diplomat's behavior driven entirely by their inner norms.

Major change in 2002 - the city allowed to revoke license plates of cars with more than 3 unpaid tickets.

Dataset: record of all (paid and unpaid) parking tickets, info includes the license plate and the country of origin of the registrant (80% personal, 20% registered by the mission itself) - individual level. Also get list of staff for each mission (generated twice a year, hence observe total mission staff and the duration of employment for individual diplomant.

Main variable of interest: country-level, unpaid violations per diplomat. Unit of observation, county x pre or post-enforcement period.

Table I - list of countries from worst to best, pre-enforcement. The top is unsurprising. (Look-up CZ, Ukraine, SK, Russia). The bottom has the expected countries plus some surprises (some missions also pay - that may be a sign of corruption!) The cross-country variance is staggering (note these are violations actually ticketed).

Table I - not the HUGE drop in the number of violations as enforcement was introduced.

The "culture" regression - estimating the number of violations in NYC as a funciton of corruption at home. Use Kaufman et al index (highly correlated with CPI anyway)

Simple regression (actually using count model - negative binomial) - number of violations as a fn of the corruption index, enforcement regime, (interaction of enforcement and corruption), number of diplomats, country characteristics.

Results: extremely robust (Table 3), even to inclusion of region dummies (corruption culture varying within a wider culture).

Implications of the size of the coeffs: moving from the most corrupt country (Nigeria) to least corrupt (Norway) reduces the number of violation by 161 log points, or about 80%. Introducing enforcement: reduction by 98%.

Lessons:

- Culture matters.
- Enforcement matters a lot (and was very cheap in this case).
- Essentially we have a picture of a lawless market - what happens when there is no enforcement and when we move to some enforcement; one wonders what would a similar experiment look like for thefts, rape etc.
- Interaction between culture and enforcement is important (a little understudied in the paper).
- A general framework how to empirically isolate the effects of culture from the effects of enforcement.

1.3 Political connections of firms

Firms often seeks political connections - success in lobbying, or politicians openly "sell" concessions only to firms that contribute to their causes. Do connections produce value to firms? How much?

Rent-seeking theory - connected firms need not earn higher profits in equilibrium (the profits were dissipated on establishing connections). However, rather firms spend resources on establishing connections, some win, some lose, the winners have ex-post positive profits, it is the expected profits that are zero.

Questions:

- How many firms are connected?
- What kind of firms/countries/industries have higher incidence of connections?
- What is the value of the connections?

1.3.1 Faccio 2006 AER: Politically connected firms

Definitions of a connected firm:

- a top official or a large shareholder (directly or indirectly controlling more than 10 pecent of the company) is a member of parliament;
- top official or large shareholder is a or a relative of a minister or head of state
- closely related - past official was a past politician, a high official is a friend of a minister or MP. Defining friendship - official mentioned as a friend of a politician in the Economist, Forbes, or Fortune (a small fraction of all observed connections, actually).

Data:

- 20,000 publicly traded firms in 47 countries, selected from Worldscope database (large companies, market capitalization over $100 million). The database also lists the top corporate officials (president, CEO, vice-president, few others, but not the whole top executive team).
- Names of large shareholders' published by each country's stock market authority
- Collects names of politicians (current members of parliament, former heads of states and prime ministers) from sources such as websites of parliaments etc.

- Matches the names of politicians and corporate officials (both names); tends to under-identify connections (family members with different names are out).

This procedure identifies 607 connections in 504 firms in the sample. (2.7% of all firms, 7.2% of market capitalization, 6.9% of the 50 largest firms in each country.) Seems to largely under-detect connections, even perhaps by narrow definition.

Explains incidence of connections - simple cross-country regressions, dep.var is percentage of firms connected. Results: Table 5. Connections correlated:

- Positively with some indicates of corruption (German index - survey of German executives on the share of transactions in each country that involves bribes; question what causes what, are connections a substitute or complement for corruption?
- Positively (hugely) with a dummy variable equal to one if a country has restrictions on the ownership of shares by foreigners (If this is causal, important finding of how markets constrain cronyism).
- Negatively with a regulatory score measuring restrictions on ownership and board membership by politicians, and whether there are disclosure requirements (very carefully constructed through cross-country sources, Internet search, survey of officials; very well documented in the paper).

Estimates value of connections (Table 6): Event study – either an existing official becomes politician or a politician joins the firm; finds 109 elections and 48 appointments to boards with an identifiable date of announcement or election; also restricts only those elections that were "surprise" (by news search). Does standard stock market event study to calculate the market-adjusted cumulative abnormal return ± 2 days around the announcement. Firm official being elected: 2.29% significant excess return. Adding politician to a firm - insignificant -0.53% excess return. Value of connecting to a minister 10 times greater than value of connecting to an MP.

2 Incentives of enforcement officials

Enforcement (p) does not just happen, important to give prosecutors, policemen, etc incentives to allocate their limited time and budgets optimally:

- No slack (that goes to agency problems rather than law and econ).
- Prosecuting the right crimes.
- Allocating resources optimally per each crime.

Some common dangers:

1. Different legal rules for different types of cases: makes certain cases "cheap" and other cases "expensive". Prosecutors then allocate resources to the cheap cases, too little deterrence of the expensive ones, even those could be the more serious crimes.
2. Budget allocations: explicit incentives to enforce certain crimes and to conduct specific activities.
3. Individual awards and career concerns: Prosecutors focusing on winning cases rather than maximizing deterrence (roughly speaking, on total sentences meted out). (American) prosecutors have huge discretion whether to prosecute a case. Observing a very high winning rate signals trouble - that prosecutor is rather focusing on few sure cases.
4. Individual awards and career concerns: (overly) high-powered incentives, perverse incentives to chase the measurable indicators rather than the appropriate social objectives.

Empirical evidence on all this is rather piecemeal and scattered, also the data has not been great. (One exception is perhaps the career objectives of prosecutors.) Some examples below:

2.1 Budget allocations

2.1.1 Mast, Benson, Rasmussen (2000) - Entrepreneurial police

The drug arrests in the U.S. rose by 72 percent just in 5 years bw 1984-89, quite a bit of variation across places.

The trigger: Federal law of 1984, allowing the state and local police to share proceeds from asset seizures captured by the federal government, if they cooperated. There are additional legislation on seizures at the state level, variation in whether the police keeps the proceeds, what fraction etc.

Obvious incentive for police to allocate resources to drug cases.

In a panel of cities, they regress (drug arrests/total arrests). The rule allowing seizures raises this by cca 20%, total drug arrests by 18%, while measures of drug use itself do not appear to affect this ratio.

Something missing in this paper: how the increased share in drug arrests translated into a reduction in other arrests - would explicitly capture some of the cost of the war on drugs.

The authors have related papers in that spirit. One (1992) on Florida counties has a (traditional) simultaneous equations framework for property crimes. Higher percentage of drug arrests by 1 percent => lower arrest rate for property crimes by 0.2 percent => with the prop crime elasticity with respect to $P(A) = 0.8$ it means higher property crime by 1.6 percent. War on drugs reallocated resources away from enforcing property crime, hence lead to higher property crime. On the other hand that paper does not endogenize the drug arrests.

2.1.2 Ater, Givati, and Rigbi: Organizational Structure, Police Activity, and Crime (JPubE 2014)

At some point, the responsibility for housing arrestees (short-term custody) was transferred from the police to the prison authority. This reforms was rolled-out in a staggered manner across 11 regions.

The police makes the initial arrest decision. It became cheaper to arrest from the narrow view of the police agency, although not cheaper from the social point of view.

Findings:

- An 11 % increase in arrests.
- 4 % reduction in crime,
- Effects concentrated among minor crimes.
- Decrease in the subsequent probability of being charged, following the arrest (lower quality of arrests).

Broader lesson: the public sector is never a single entity, division of activities between agencies matter. Each agency behaves as a stand-alone economic agent, pursuing its narrow objectives (these could well be its official – but narrow – noble objectives, plus lobbying for greater size, consumption of its employees, etc.). They always spend their budget.

Reading list for this chapter

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